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## Annual Report

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For the period of January 1, 2016 through December 31, 2016

IM Flash Technologies, LLC  
*Facility Name*

4000 North Flash Drive Lehi 84043  
*Facility Street Address* *City* *Zip*

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## Project Status

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On a separate sheet, summarize:

- your Clean Utah project commitments and accomplishments made to date,
- major indicators of environmental improvements (measurable ways that you are determining the environment is improving as the result of steps you are taking),
- public participation activities you have undertaken, and
- your project plans for next year, as they relate to this program.

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## Certification Statement

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*(to be signed by the senior facility manager)*

I certify that to the best of my knowledge the information outlined in the attached annual report is correct and that this facility continues to meet all program criteria and has an active EMS, as defined by the Clean Utah program. I further certify that this facility has conducted periodic assessments of compliance with legal requirements, has corrected all identified instances of noncompliance, and is currently in material compliance with all applicable federal, state, and local environmental rules and regulations.

A handwritten signature in blue ink, appearing to read "B. Mortensen".

Signed

February 15, 2017

Date

Brad Mortensen  
Print Name

Facilities Director  
Title

## Projects Completed Calendar Year 2016

### Project #1 – Energy Conservation (In Progress)

IM Flash Technologies, LLC (IM Flash) is committed to reducing environmental impacts from our operations. IM Flash generates and uses ultra-pure water for manufacturing semiconductor products. Producing ultra-pure water includes the operation of ultra-violet (UV) light as a polishing step. Historical data suggests that organic compounds in the water are typically relatively low and below the requirement for UV treatment.

**Commitment:** This project is designed to reduce the amount of electrical energy used in the production of ultra-pure water. IM Flash will install additional water quality monitoring equipment which will provide for a new control scheme of the UV light system. IM Flash anticipates that this new approach will reduce electrical energy consumption and create an indirect reduction in GHG emissions.

**Accomplishments:** Installation of equipment was completed this year. Quality assurance of the monitoring system is in progress. This project will be extended through calendar year 2017.

**Indicators:** IM Flash will monitor the use of the new control system and track the capacity factor of the UV system during the year. At the end of the year, the savings and environmental benefit from the anticipated reduction in electrical energy use will be tabulated.

## Project #2 – Conservation of Natural Resources and Sustainability

IM Flash Technologies, LLC (IM Flash) manufactures semiconductor products. A variety of high purity gases are used in the manufacturing process. One of these gases is the noble gas: neon. Neon is a product from large air separation plants using methods of liquefaction of gases and fractional distillation. The total number of these large air separation plants is limited in the global economy. Since neon is present in ambient air at very low concentrations (18 ppmv), the energy required to distill large quantities of neon from air is significant.

**Commitment:** IM Flash will work with a high purity gas supplier to install and operate a unique system to capture gases used in the semiconductor manufacturing process. These gases will be repackaged in cylinders and returned to the supplier for reclamation and reuse of neon. Successful completion of this project could lead to this process being replicated at other semiconductor facilities.

**Accomplishments:** Installed and operated a first-of-a-kind neon recovery system designed to recover neon gas used in the semiconductor manufacturing process. Approximately 1,300 lb of neon gas was recovered during calendar year 2016. The recovered gas was returned to the gas supply vendor for recycling. The system operated at a recovery rate of close to 100%. Over 130 million pounds of air must be processed in an air separation plant to purify 1,300 lb of neon.

Environmental impacts associated with this project are related to the avoidance of energy use required to liquefy air and to purify neon through distillation. Expenditures associated with the processing of an equivalent amount of air to purify 1,300 lb of neon gas represent the potential annual savings from this project. The primary benefit of this project is the creation of a closed-loop supply chain and ensures that the supply of neon will be sustainable in the future. Table 1. summarizes the project results.

Table 1. Summary of Project Impacts

Recovery rate	~ 100%
Quantity of neon gas recovered	~ 1,300 lb
Equivalent mass of air processed at an air separation plant*	130,773,000 lb

\* Unable to determine cost associated with operating an air separation plant.

### Project #3 – Energy Conservation

IM Flash Technologies, LLC (IM Flash) manufactures semiconductor products and operates continuously every day of the year. The facility is relatively large and ambient lighting is required for workspaces and employee safety. Technological advances in lighting options have provided opportunities for IM Flash to replace existing light fixtures with new energy efficient light fixtures.

**Commitment:** Continue energy efficiency efforts by replacing existing light fixtures with new energy efficient light fixtures. This project is consistent with IM Flash's commitment to conserve natural resources and reduce environmental impacts associated with our operations.

**Accomplishments:** IM Flash completed a significant project to replace existing lighting with LED lamps. The quantity of lamps replaced exceeded 33,000. Energy savings from the implementation of this project is based on published specifications for the light fixtures and the number of fixtures replaced. Economic and environmental impacts associated with this project are summarized in Table 2.

Table 2. Summary of Project Impacts

Number of lamps replaced	> 33,000
Annual energy savings	2,955,850 kWhr/yr
Annual cost savings*	\$201,000/yr
Indirect GHG reduction	1,832 MTCO <sub>2</sub> e

\* Cost savings based on EPA Pollution Prevention Program's Cost Calculator



## Projects Proposed for Calendar Year 2017

### Project #1 – Energy Conservation (Project Continued from 2016)

IM Flash Technologies, LLC (IM Flash) is committed to reducing environmental impacts from our operations. IM Flash generates and uses ultra-pure water for manufacturing semiconductor products. Producing ultra-pure water includes the operation of ultra-violet (UV) light as a polishing step. Historical data suggests that organic compounds in the water are typically relatively low and below the requirement for UV treatment.

**Commitment:** This project is designed to reduce the amount of electrical energy used in the production of ultra-pure water. IM Flash will install additional water quality monitoring equipment which will provide for a new control scheme of the UV light system. IM Flash anticipates that this new approach will reduce electrical energy consumption and create an indirect reduction in GHG emissions.

**Accomplishments:** Installation of equipment was completed this year. Quality assurance of the monitoring system is in progress. This project will be extended into calendar year 2017.

**Indicators:** IM Flash will monitor the use of the new control system and track the capacity factor of the UV system during the year. At the end of the year, the savings and environmental benefit from the anticipated reduction in electrical energy use will be tabulated.

## Project #2 – Air Emissions Reduction

IM Flash Technologies, LLC (IM Flash) is committed to reducing environmental impacts from our operations. IM Flash is located in a PM<sub>2.5</sub> non-attainment area and reductions in particulate emissions is desirable. IM Flash will evaluate various process gas abatement equipment that may reduce fine particulate emissions from process gases containing tungsten.

**Commitment:** Identify, evaluate and install semiconductor manufacturing abatement equipment that will reduce fine particulate emissions from the manufacturing process.

**Accomplishments:** TBD

**Indicators:** This project will involve the following targets:

- Evaluate future use of tungsten containing process gases
- Consult with research and development personnel and vendors regarding abatement options including destruction and removal efficiencies
- Conduct an evaluation of selected abatement tools
- Determine minimum technology for future tungsten abatement